REMARKS

By this amendment, claims 1, 10, 11, 20, 21, 30, 31, 41, 50, 51, and 61 have been amended. Claims 4, 6, 14, 16, 24, 26, 44, and 46 have been cancelled. Claims 1, 3-11, 13-21, 23-41 and 43-61 are rejected. Claims 4, 6, 10, 14, 16, 20, 24, 26, 30, 44, and 46 are cancelled. New claims 62-65 have been added. No new subject matter was added pursuant to these amendments. Thus, claims 1, 3, 5, 7-13, 15, 17-23, 25, 27- 43, 45, and 47-65 are pending in the present application.

In the Office Action mailed September 12, 2006, claims 4, 6, 10, 14, 16, 20, 24, 26, 30, 44, 46, and 50 were objected to as to informalities. Since claims 4, 6, 14, 16, 24, 26, 44, 46 have been cancelled and claims 10, 20, 30, 50 have been amended, Applicants have traversed the Examiner's objections. Claim 61 stands objected to under 37 CFR § 1.75 as being a substantial duplicate of claim 1. Pursuant to amendments to claim 1 and 61, Applicants respectfully submit that objections to claim 61 be withdrawn.

In the Office Action, claims 1, 3-11, 13-21, 23-41, and 43-61 were rejected under 35 USC § 112, first paragraph, as allegedly failing to comply with the written description requirement. Applicants respectfully traverse this rejection. The Examiner asserted that the Applicants recited the limitation "modeling said dependence of the deposition rate being based upon a target life of the sputter target." The Examiner alleges that there is no support in the original disclosure for this limitation. As amended, claims 1, 11, 21, 41, 51 and 61 find support in the Applicant's Specification. For the aforementioned reasons, Applicants respectfully submit that the Examiner's objections of claims 1, 11, 21, 41, 51 and 61 under section 112, first paragraph, be withdrawn.

In the Office Action mailed September 12, 2006, on page 3, the Examiner further objects to claims 1, 11, 21, 41, 51 and 61. The Examiner asserted that the Applicants recited the limitation "modeling said dependence of the deposition rate comprising using sensor data relating to deposition rate for performing said modeling," without support in the Applicant's Specification. As amended, claims 1, 11, 21, 41, 51 and 61 find support in the Applicant's Specification. For the aforementioned reasons, Applicants respectfully submit that the Examiner's objections of claims 1, 11, 21, 41, 51 and 61 under section 112, first paragraph, be withdrawn.

As the Examiner well knows that the purpose of a claim is to define the invention, not to explain it. "A claim need not 'describe' the invention, such description being the role of the disclosure". It is not the role of the claims to include a self-contained explanation of every step. "The purpose of the claims is not to explain the technology or how it works, but to state the legal boundaries of the patent grant. A claim is not 'indefinite' simply because it is hard to understand without the benefit of the specification."

In view of the above, claims 13-15 meet the requirements of §112, second paragraph. The claim need not "describe" an invention, since description is properly provided by the specification's disclosure section. As the specification describes paging, it is not necessary to repeat this description in the claims. In view of the specification and cited case law, this rejection should be withdrawn.

In addition, claims 1, 3-11, 13-21, 23-41, and 43-61 were rejected under 35 USC §112, second paragraph, as being indefinite. Applicants respectfully traverse this rejection. Claims 41 and 43-50 were rejected under 35 USC §112, second paragraph, as being incomplete. Applicants respectfully traverse this rejection. In the Office Action, the Examiner asserted that some of the

rejections under 35 U.S.C. § 112, second paragraph, were not fully responded to by the Applicants. Applicants respectfully disagree. Further, Applicants further respond to these rejections and Examiner's assertions in the Office Action dated September 12, 2006. The Examiner asserted that the Applicants recited the limitation "target life of the sputter target," but meaning of this limitation is unclear. Applicants respectfully disagree. As set forth in the present application, known potential characteristic parameters, such as the target life of a sputter target may be identified by characteristic data patterns or may be identified as known consequences of modifications to metal deposition processing (MDP) control. See Applicant's Specification, page 28, ll. 11-17. The dependence of the deposition rate on the target life of the sputter target may be determined by modeling and/or fitting previously obtained metal deposition processing data. For example, data points may be taken relating to the degree of sputter target consumption, as measured by sputter target life p to the deposition rate t of metal layers being formed, such as a set of N+1 data points (p_i, t_i) where i=1, 2, ..N, N+1. The values may be actually measured values of the metal deposition processing tool variables and/or metal deposition processing parameters. See Applicants' Specification, page 31, line 13- page 32, line 10. In this manner, the "target life" described as a measure of the "degree of sputter target consumption" related to the deposition rate, it may not be necessarily equated to the "target age," which is measured in Kilo Watt Hours (KWH), as described by ***Actor*** and ***Turner***. Accordingly, Applicants respectfully request that the Examiner's objections to claims 1, 11, 21, 31, 41, 51 and 61 under section 112, second paragraph, be withdrawn.

Accordingly, Applicants respectfully traverse the § 112 rejection of claims 1, 11, 21, 31, 41, 51 and 61. Under the requirement for particularity and distinctness in claim language, i.e., definiteness in claiming in view of the § 112, second paragraph, it is not necessary that the

claims recite the details of use of the invention set out in the Specification. In fact, in the absence of evidence from Applicants to the contrary, the claims must be presumed to be what Applicants regards to be their invention. Moreover, breadth alone does not make a claim indefinite. So long as the language used defines the invention with a reasonable degree of particularity and distinctness, a claim may in general, be drawn as broadly as the prior art will allow. See M. P. E. P. § 706.03(d). It is also well settled that a choice of wording is not a basis for objection and rejection as long as it is definite and not inconsistent with accepted terminology in the art. If patentable novelty is disclosed and it is apparent that the claims are directed to such patentable subject matter, some latitude in the manner of expression and the aptness of terms is permitted even though the claim language is not as precise as the Examiner might desire. See M. P. E. P. § 706.03(d). Therefore, Applicants respectfully submit that claims 1, 11, 21, 31, 41, 51 and 61 are clear and request that the Examiner's rejections be withdrawn.

Consequently, Applicants respectfully request immediate reconsideration and allowance of their pending claims in the present application. Applicants also believe that a full and complete response has been made to the Office Action. The Examiner is respectfully requested to consider all the pending claims.

In the Office Action mailed September 12, 2006, claims 1, 3-11, 13-21, 23-41, and 43-61 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent Number 5,478,455 to ***Actor***. Applicants respectfully traverse the Examiner's rejections.

With regard to amended independent claim 1, Applicants describe and claim, among other things, modeling a dependence of the deposition rate on at least one of deposition plasma power and deposition time. The method of claim 1 further calls for modeling the dependence of the deposition rate comprising using sensor data relating to metal deposition processing for

performing the modeling. Finally, the method comprises modeling the dependence of the deposition rate based upon a target life of the sputter target. Applicants respectfully assert that the Examiner's application of ***Actor*** to claim 1 for the purposes of anticipation is flawed. For at least the reasons set forth below, claim 1 is allowable and its dependent claims 3, 5, and 7-10 are also allowable.

In response to the Applicants' arguments, the Examiner reasserts that every element of claim 1 is taught by ***Actor***. In particular, at pages 6-7 of the Office Action dated September 12, 2006, the Examiner alleges that ***Actor*** determines the formula described in Col. 7, line 33 either empirically or through computer modeling. The Examiner then alleges that if the formula were determined empirically, or through observation, then the deposition rate must be observed somehow. According to the Examiner, since ***Actor*** determines the deposition rate and uses its value in the formula determined using computer modeling, the deposition rate is likely determined based on a known relationship between the deposition rate and the target age. In this way, the Examiner asserts that ***Actor*** obtains the deposition rate of the sputtered species and concludes that all the features of claim 1 were anticipated by ***Actor.*** Applicants respectfully disagree for at least the reasons set forth below.

Actor at least does not teach modeling a dependence of the deposition rate on deposition plasma power and/or deposition time, set forth in claim 1. In ***Actor***, computer modeling formulates a predetermined compensation formula that adjusts a selected sputtering parameter such as deposition time or deposition power on a wafer basis. That is, ***Actor*** describes techniques for controlling a collimated sputtering source by modeling that formulates a predetermined compensation formula. As such, to formulate the compensation formula, ***Actor*** either empirically measures the selected sputtering parameter for determining its value or models

a value of the selected sputtering parameter. *See* ***Actor***, col. 5, lines 22-34. This modeling to formulate a predetermined compensation formula or modeling a value of the selected sputtering parameter by ***Actor***, however, does not teach or suggest modeling a dependence of the deposition rate on at least one of the two deposition parameters. ***Actor*** is completely silent about modeling a dependence of the deposition rate on deposition plasma power and/or deposition time, as set forth in claim 1.

The Examiner alleges that ***Actor*** teaches modeling a dependence of the deposition rate on deposition plasma power and/or deposition time, set forth in claim 1. ***Actor*** does not support the Examiner's argument because ***Actor*** models a value of the selected sputtering parameter. That is, in the Office Action, the Examiner appears to assert teaching of the modeling feature because according to the Examiner, the deposition plasma power and deposition time, in claim 1, correspond to sputtering parameters such as deposition time or deposition power in ***Actor.*** In other words, according to the Examiner, the deposition plasma power and/or deposition time are equivalent to the sputtering parameters of ***Actor***. In ***Actor***, however, dependence of the deposition rate on the sputtering parameters is not modeled, but rather a value of the selected sputtering parameter is modeled. Accordingly, modeling a dependence of the deposition rate on deposition plasma power and/or deposition time, as recited in the method of claim 1, is distinct from modeling a value of a selected sputtering parameter.

As amended, the method of claim 1 includes using sensor data relating to metal deposition processing for performing the modeling a dependence of the deposition rate on deposition plasma power and/or deposition time. Additionally, claim 1 calls for modeling a dependence of the deposition rate on deposition plasma power and/or deposition time based on a target life of the sputter target during metal deposition processing. At most, ***Actor*** uses computer

modeling for formulating a predetermined compensation formula that adjusts a selected sputtering parameter such as deposition time or deposition power on a wafer basis. However, ***Actor*** deposits a film at a predetermined thickness as a function of the age of the collimator 60 distinct from the sputter target 70. *See* ***Actor,*** col. 5, line 45. Applicants respectfully submit that ***Actor*** is completely silent about using sensor data relating to metal deposition processing for performing the modeling a dependence of the deposition rate based upon a target life of the sputter target.

In the Office Action, claims 51-60 stand rejected under 35 U.S.C. § 101 as allegedly being unstatutory subject matter. In light of the amendments to independent claim51 and arguments provided herein, Applicants respectfully traverse this rejection.

In the previous related Office Action, the Examiner rejected claims 1, 3-11, 13-21, 23-41 and 43-61 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,478,455 ***(Actor)***. Applicants respectfully traverse this rejection.

Applicants respectfully assert that ***Actor*** does not disclose or suggest all of the elements of claim 1 of the present invention. ***Actor*** is directed to calculating a multiplier factor as a function of the age of a collimator sputtering source to adjust a parameter during film deposition. The Examiner relies on the disclosure that a formula is used to compensate for changes in the deposition rate due to erosion of the sputter target. *See*, col. 6, lines 13-33. However, contrary to Examiner's assertion, ***Actor*** simply does not disclose a dependence of the deposition rate on a plasma power and deposition time. The Examiner cites the disclosure in ***Actor*** that relates to increasing the deposition time after processing each wafer, as well as increasing the deposition power after processing each wafer. *See*, col. 6, lines 19-22. However, this does not equate to modeling the dependence of the deposition rate based on the deposition plasma power and the

deposition time, as called for by Claim 1 of the present invention. ***Actor*** merely discloses increasing a predetermined scheduled increase in deposition time and deposition power after processing each wafer. This simply does not equate to modeling the dependence of the deposition rate based on the deposition plasma power and the deposition time, as called for by claims of the present invention.

Further, ***Actor*** simply does not disclose that modeling the dependence of the deposition rate being based on the target life of the sputter target. Again, the Examiner relies on the disclosure that using a formula to change the deposition rate due to erosion of sputter target equates to modeling the dependence on the deposition rate based on the target life of the sputter target. *See*, col. 6, lines 29-31. Therefore, this yet is another element that is not taught or suggested by ***Actor***. Further, the Examiner asserted that ***Actor*** discloses modeling the dependence of the deposition rate comprising using sensor data relating to deposition rate for performing said modeling is also disclosed by ***actor***. This statement in the claim has been amended and now calls for modeling the dependence of the deposition rate comprising using sensor data relating to metal deposition processing for performing the modeling. ***Actor*** simply does not disclose using any type of sensor data relating to metal deposition to perform to control the deposition rate. In fact, ***Actor*** simply does not disclose modeling of dependency of one deposition or sputtering parameter on at least one of two other deposition or sputtering parameters of a model, much less modeling based upon sensor data relating to metal deposition processing. The Examiner asserted that "if the formula were determined empirically, or through observation, then the deposition rate must be observed somehow and that it would seem inherent that some sort of rate sensor would have been used." *See*, page 7 of the Office Action dated September 12, 2006. Applicants respectfully assert that it is not inherent that any type of sensor

is used by ***Actor***. In fact, the mere mention of deposition rate sensor was dismissed as expensive and unreliable and ***Actor*** actually discourages such use. *See*, col. 2, lines 45-47.

Further, ***Actor*** simply does not disclose utilizing any type of sensor that provides data relating to metal deposition processing, much less modeling deposition rate based upon such data. Therefore, yet another portion of the claim is not taught, disclosed or suggested by ***Actor***. Hence, all of the elements of claim 1 of the present invention are not taught, disclosed or suggested by ***Actor***. Additionally, independent claims 11, 21, 31, 41, 51, and 61, which have similar elements that call for modeling the dependence of the deposition rate on the plasma power or deposition time based upon the target life, and using the model to modify the deposition processing to approach a desired thickness, are also allowable for at least the reasons cited above. Therefore, in light of at least the above-presented arguments, claims 11, 21, 31, 41, 51, and 61 are also allowable.

Independent claims 1, 11, 21, 31, 41, 51, and 61, are allowable for at least the reasons cited above. Additionally, dependent claims 3-10, 12-20, 23-30, 32-40, 43-50, and 52-60, which depend from independent claims 1, 11, 21, 31, 41, and 51, respectively, are also allowable for at least the reasons cited above.

In the previous related Office Action, the Examiner rejected claims 1, 5, 6, 10, 11, 15, 16, 20-21, 25, 26, 30-32, 35, 36, 40-41, 45, 46, 50-52, 55, 56 and 60 under 35 U.S.C. 102(b) as being anticipated by ***Turner***. Applicants respectfully traverse this rejection.

The present invention is directed to modeling the dependence of the deposition rate on plasma power or the deposition time based upon the target life of the sputter target. This is in contrast with ***Turner*** since it does not disclose modeling the deposition rate at all. ***Turner*** discloses a sputtering system, in which the desired deposition rate information is inputted by an

operator to calculate the required power (see col. 3, lines 30-34). ***Turner*** discloses that deposition rate sensors are not used to complete a feedback loop, but use the sputtering source itself. ***Turner*** discloses using the sputtering to allow for regulation and correction of a process (col. 3, lines 64-67). However, ***Turner*** does not disclose monitoring the consumption of a sputter target to determine a deposition rate, as called for by claims of the present invention.

Applicants assert that claims 1, 5, 6, 10, 11, 15, 16, 20-21, 25, 26, 30-32, 35, 36, 40-41, 45, 46, 50-52, 55, 56 and 60 are not anticipated by ***Turner***. The claims of the present invention calls for modeling the dependence of the deposition rate, which includes using the deposition sensor data for performing the modeling of the dependence of the deposition rate to a deposition plasma power or a deposition time based upon a target life of the sputter target, which is not disclosed by ***Turner***. The Applicants respectfully assert that ***Turner*** does not disclose or suggest all of the elements of the claims of the present invention. For example, the Examiner cites column 3, lines 22-32 of ***Turner*** to read upon the element of monitoring the consumption of the sputter target to determine a deposition rate, as called for by claims of the present invention. However, ***Turner*** merely discloses that the deposition rate, the power consumption, and the aging characteristics may be expressed as an empirically obtained function specific to the cathode material. The age of the cathode is expressed in kilowatt hours. *See*, col. 3, lines 23-32. However, this does not relate consumption of a sputter target to the deposition rate and indicate modeling the dependence on the deposition rate based on the target life of the sputter target. Merely expressing aging characteristics in a function with the cathode material as one of its parameter does not relate to performing the modeling of the dependence of the deposition rate based on the target life of the sputter target as called for by claims of the present invention.

Further, in the previous related Office Action, the Examiner makes an implication of deposition plasma power and target life from ***Turner***. However, this implication is not supported by either the Examiner's arguments, or by the disclosure of ***Turner***. The power consumption disclosed by ***Turner*** generally refers to the power dissipated by the excitation source, which is monitored by examining the current drawn from the cathode and the cathode-anode voltage (*See* col. 1, lines 42-47). ***Turner*** does not disclose modeling the dependence of the deposition rate to a deposition plasma power, and Applicants respectfully assert that the Examiner does not offer evidence to imply the deposition plasma power. Applicants respectfully assert that there is no disclosure or any evidence provided by the Examiner to make such an implication and it would be inappropriate in a rejection under 35 U.S.C. § 102. ***Turner*** discloses that the current drawn from the cathode supply is controlled in response to power dissipated in the plasma, the cumulative usage of the particular target, the pressure and the desired deposition rate. (*See* col. 3, lines 7-11). However, ***Turner*** does not disclose modeling these relationships. Furthermore, ***Turner*** does not disclose modeling based upon a target life of the sputter target, as called for by claims of the present invention. Therefore, the claims of the present invention are allowable.

Also, the Examiner cites the sputtering source in ***Turner***, which the Examiner assert may be used to provide rate information to illustrate a prior art sensor. However, Applicants respectfully assert that even though ***Turner*** may mention deposition rate monitors that are used to control the excitation source of the plasma discharge and/or the sputtering source, these disclosures are not enough to anticipate or suggest all of the elements of claim 1 of the present invention. For example, as explained in more detail below, ***Turner*** does not disclose modeling the dependence of the deposition rate on plasma power. As another example, ***Turner*** does not disclose modeling any parameters based upon target lives, as called for by claim 1 of the present

invention. Although ***Turner*** refers to a deposition monitor, ***Turner*** does not disclose using the deposition monitor to perform any type of modeling. In fact, ***Turner*** discourages the use of the deposition monitor in contrast to the use of deposition sensor data to perform a modeling, as called for by the claims of the present invention. (***Turner*** discloses that a deposition rate sensor is not used to complete the feedback loop of ***Turner***, *See* col. 3, lines 64-65). Therefore, for at least the reasons cite above, all of the elements of claim 1 are not taught, disclosed, or suggested by ***Turner***, and therefore, is allowable.

Turner discloses a sputtering system, in which the desired deposition rate information is inputted by an operator to calculate the required power (*See* col. 3, lines 30-34). ***Turner*** discloses that deposition rate sensors are not used to complete a feedback loop, but use the sputtering source itself. ***Turner*** discloses using the sputtering to allow for regulation and correction of a process (*See* col. 3, lines 64-67). However, ***Turner*** does not disclose monitoring the consumption of a sputter target to determine a deposition rate, as called for by claim 1 of the present invention. ***Turner*** discloses using the power and duration of the sputtering source operation and calculating a percentage of normalized deposition rate.

Furthermore, claim 1 of the present invention calls for modeling the dependence of the deposition rate on plasma power or the deposition time based upon the target life of the sputter target. This is in contrast with ***Turner*** since it does not disclose modeling the deposition rate at all. The Examiner cites the chart in Figure 1 and implies that it refers to modeling of plasma power. Applicants respectfully disagree with this implication. Figure 1 merely plots a relationship between a percentage of normalized deposition rate and kilowatt-hours of operation of the cathode (*See* Figure 1 and col. 2, lines 35-44). This is provided to illustrate the deterioration of the deposition rate. However, this is not equivalent to modeling the dependence

of the deposition on plasma power or the deposition time based upon the target life of the sputter target, since ***Turner*** merely demonstrates the deterioration of the deposition rate after a certain amount of kilowatt-hours.

Additionally, the Examiner equates aging of the cathode in use to "target lives," however, the "target lives" refer to the lives of the sputter targets (*See* col. 2, lines 10-13). Therefore, ***Turner*** does not call for modeling any parameters based upon target lives. Additionally, the Examiner states that the graph in Figure 1 plotting the percentage of normalized deposition rate versus the cathode operation (kilowatt-hours) can be used to imply a modeling of deposition rate to plasma power. However, the Examiner offers neither arguments nor evidence to support such a conclusion, nor is there any evidence in ***Turner*** to support such an assertion. Therefore, ***Turner*** does not disclose the element of modeling the dependence of the deposition on plasma power or the deposition time based upon the target life of the sputter target, or using the model to modify a deposition process, as called for by claim 1 of the present invention.

Turner discloses using the desired rate specified by the operator, and using an equation in a loop to correct the power for the usage of a cathode used in the sputtering system (*See* col. 3, lines 32-38, and the equation on col. 3, line 27). ***Turner*** discloses that the duration of the cathode usage is then incremented, updating the kilowatt hours of use (*See* col. 3, lines 38-42). ***Turner*** corrects the current control of the cathode power supply and continues the loop for controlling the processing of a semiconductor wafer (*See* col. 3, lines 46-49). In contrast to ***Turner***, claim 1 calls for modeling the dependence of the deposition rate on the plasma power or deposition time based upon the target life, and using the model to modify the deposition processing to approach a desired thickness. Therefore, claim 1 is not taught, disclosed, or suggested by ***Turner***. Hence, claim 1 is allowable. Additionally, independent claims 11, 21, 31,

41, 51, and 61, which have similar elements that call for modeling the dependence of the deposition rate on the plasma power or deposition time based upon the target life, and using the model to modify the deposition processing to approach a desired thickness, are also allowable for at least the reasons cited above. Therefore, in light of at least the above-presented arguments, claims 11, 21, 31, 41, 51, and 61 are also allowable.

Independent claims 1, 11, 21, 31, 41, 51, and 61, are allowable for at least the reasons cited above. Additionally, dependent claims 3-10, 12-20, 23-30, 32-40, 43-50, and 52-60, which depend from independent claims 1, 11, 21, 31, 41, and 11, respectively, are also allowable for at least the reasons cited above.

In the previous related Office Action, claims 1, 3-11, 13-21, 23-41 and 43-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Actor*** in view of U.S. Patent No. 5,665,214 ***(Iturralde)***. Applicants respectfully traverse this rejection.

Applicants respectfully assert that the claims of the present invention is not taught, disclosed, or made obvious by ***Actor***, ***Iturralde***, or their combination. The Examiner adds ***Iturralde*** to the disclosure of ***Actor*** to argue obviousness of the element of sensor data relating to metal deposition processing to the disclosure to read upon claims of the present invention. However, the mere addition of the metal deposition processing sensor data into the disclosure of ***Actor*** would not make obvious all of the elements of claims of the present invention. As described above, various modeling elements of the claims of the present invention are not disclosed, taught or suggested by ***Actor***, and ***Iturralde*** does not make up for this deficit.

Further, those skilled in the art would not combine ***Iturralde*** and ***Actor***. For example, the Examiner uses the disclosure of deposition rate sensor in ***Iturralde*** to combine with ***Actor*** to make obvious the elements of claims of the present invention. However, this particular use of

combining the disclosure, *i.e.*, metal deposition processing sensor data, would not be employed by those skilled in the art since ***Actor*** specifically *teaches away* from the sensor data relating to metal deposition processing. ***Actor*** specifically suggests that deposition rate sensors are expensive and unreliable and have not gained wide spread commercial acceptance. *See*, col. 2, lines 45-47. Therefore, those skilled in the art would be taught away from employing the disclosure of ***Iturralde*** upon our reading of ***Actor***. Therefore, those skilled in the art would not be motivated to combine ***Actor*** and ***Iturralde*** to make obvious all elements of claims of the present invention. In fact, those reading ***Actor*** and ***Iturralde*** would be directed to not use the metal deposition processing sensor data of ***Iturralde*** when employing the concepts of ***Actor***. Additionally, as described above, even if ***Actor*** and ***Iturralde*** were to be combined as described above, all of the elements of the claims of the present invention (*e.g.*, the modeling) would not be taught or made obvious. Therefore, the Examiner has failed to prove a *prima facia* case of obviousness of claims 1, 3-11, 13-21, 23-41, and 43-61. Accordingly, claims 1, 3-11, 13-21, 23-41, and 43-61 on the present invention are allowable.

In the previous related Office Action, the Examiner rejected claims 3, 4, 7, 8, 13, 14, 17, 18, 23, 24, 27, 28, 33, 34, 37, 38, 43, 44, 47, 48, 53, 54, 57, 58 and 61 under 35 U.S.C. 103(a) as being unpatentable over ***Turner*** in view of U.S. Patent No. 6,217,720 ***(Sullivan)***. Applicants respectfully traverse this rejection.

The Examiner does not establish a *prima facie* case of obviousness of claims 3, 4, 7, 8, 13, 14, 17, 18, 23, 24, 27, 28, 33, 34, 37, 38, 43, 44, 47, 48, 53, 54, 57, 58, and 61, at least because the prior art references (***Turner*** and ***Sullivan***) when combined do not teach or suggest all of the claims limitations. Accordingly, the Examiner did not meet the legal standards to reject

the claims 3, 4, 7, 8, 13, 14, 17, 18, 23, 24, 27, 28, 33, 34, 37, 38, 43, 44, 47, 48, 53, 54, 57, 58, and 61 under 35 U.S.C. § 103(a).

The combination of ***Turner*** and ***Sullivan*** does not disclose, suggest, or make obvious all of the elements of claims 3, 4, 7, 8, 13, 14, 17, 18, 23, 24, 27, 28, 33, 34, 37, 38, 43, 44, 47, 48, 53, 54, 57, 58, and 61. The Examiner stated that the elements relating to the dependence of the deposition rate on the deposition time or inverting the deposition rate model to determine the deposition time is not disclosed by ***Turner,*** and uses ***Sullivan*** to provide such elements. However, as described above, ***Turner*** does not disclose methods and/or apparatus for modeling the dependence of the deposition rate on the plasma power or deposition time based upon the target life, and using the model to modify the deposition processing to approach a desired thickness, which are called for by claims 3, 4, 7, 8, 13, 14, 17, 18, 23, 24, 27, 28, 33, 34, 37, 38, 43, 44, 47, 48, 53, 54, 57, 58, and 61 by virtue of their respective dependencies. Therefore, adding the disclosure from ***Sullivan*** would not make-up the deficit of ***Turner***.

Sullivan discloses a multi-layer sputtering method in which a controller calculates a sputtering time required for the deposition of a specified layer thickness (*See* col. 7, lines 54-57). ***Sullivan*** discloses a theoretical model that models deposited layer. However, ***Sullivan*** does not disclose modeling the dependence of deposition rate to deposition time. ***Sullivan*** adjusts the layer thickness in the theoretical model (*See* col. 7, lines 65-67). The Examiner states that, the fact that determining a deposition time requires a certain deposition rate equates to modeling a dependence of deposition rate on the deposition time. Applicants respectfully disagree. No evidence or argument that would support such a conclusion is provided. ***Sullivan*** is directed towards calculating sputtering time for deposition of specified layer thickness, deposition rates are not calculated in this context. Additionally, ***Sullivan*** does not disclose inverting the

deposition rate model to determine the deposition time to reach a deposition rate. Therefore, for at least the reasons cited above, adding the disclosure of ***Sullivan*** to the disclosure of ***Turner***, would not provide all of the elements of claims 3, 4, 7, 8, 13, 14, 17, 18, 23, 24, 27, 28, 33, 34, 37, 38, 43, 44, 47, 48, 53, 54, 57, 58 and 61. Therefore, in light of at least the above presented arguments, claims 3, 4, 7, 8, 13, 14, 17, 18, 23, 24, 27, 28, 33, 34, 37, 38, 43, 44, 47, 48, 53, 54, 57, 58 and 61 are allowable.

In the previous related Office Action, the Examiner rejected claims 9, 19, 29, 39, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Turner*** as applied to claims 1, 2, 11, 12, 21, 22, 31, 32, 41, 42, 51 and 52. Applicants respectfully traverse this rejection.

Applicants respectfully assert that the Examiner did not meet the legal standards to reject the claims of the present invention under 35 U.S.C. § 103(a), including the fact that the prior art reference (***Turner***) does not teach or suggest all the claim limitations of claims 9, 19, 29, 39, and 59 of the present invention. The prior art reference (***Turner***) does not teach or suggest all the claim limitations of claims 9, 19, 29, 39, and 59. Additionally, the Examiner provided no evidence to support a contention of some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference. Therefore, the Examiner does not establish a *prima facie* case of obviousness of claims 9, 19, 29, 39, and 59 of the present invention.

In light of the arguments provided herein, Applicants respectfully assert that ***Turner*** does not disclose methods and/or apparatus for modeling the dependence of the deposition rate on the plasma power or deposition time based upon the target life using deposition sensor rate data, and using the model to modify the deposition processing to approach a desired thickness, which are called for by claims 9, 19, 29, 39, and 59. The Examiner uses obviousness arguments to provide

the element of modeling deposition rate and power using curve-fitting techniques. However, Applicants respectfully assert that the Examiner does not provide any evidence to support such an assertion. Furthermore, even if, *arguendo*, the element of modeling deposition rate and power using curve-fitting techniques were added to the disclosure of ***Turner***, the deficit of ***Turner*** would not be compensated for since ***Turner*** does not disclose modeling the dependence of the deposition rate on the plasma power or deposition time based upon the target life using the sensor data relating to metal deposition processing, and using the model to modify the deposition processing to approach a desired thickness, which are called for by claims 9, 19, 29, 39, and 59. Therefore, claims 9, 19, 29, 39, and 59 are allowable for at least the reasons cited above.

The Examiner objected to claims 4, 6, 10, 14, 16, 20, 24, 26, 30, 44, 46 and 50, due to the claims being dependent on a rejected claim. However, in light of the arguments and amendments presented herein, the claims from which dependent claims 4, 6, 10, 14, 16, 20, 24, 26, 30, 44, 46 and 50 depend are now allowable. Accordingly, the objections to claims 4, 6, 10, 14, 16, 20, 24, 26, 30, 44, 46 and 50 are now moot and therefore, claim 4, 6, 10, 14, 16, 20, 24, 26, 30, 44, 46 and 50 are also allowable.

In light of the arguments presented above, Applicants respectfully assert that claims 1, 3-11, 13-21, 23-41 and 43-61 are allowable. In light of the arguments presented above, a Notice of Allowance is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, **the Examiner is requested to call the undersigned attorney at the Houston, Texas telephone number (713) 934-4089** to discuss the steps necessary for placing the application in condition for allowance.

Please date stamp and return the enclosed postcard to evidence receipt of this document.

Respectfully submitted,

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